

Date: Thu, 11 Aug 94 04:30:25 PDT  
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>  
Errors-To: Ham-Homebrew-Errors@UCSD.Edu  
Reply-To: Ham-Homebrew@UCSD.Edu  
Precedence: Bulk  
Subject: Ham-Homebrew Digest V94 #231  
To: Ham-Homebrew

Ham-Homebrew Digest                      Thu, 11 Aug 94                      Volume 94 : Issue    231

Today's Topics:

                    AGC: Audio vs. IF derived  
                                cell sites  
                    Ferrite cores and beads  
                    Freq standard from TV Colorburst subcar  
                    Freq standard from TV Colorburst subcarrier (3 msgs)  
                                IC-751A HF Transceiver  
                    New Life For Old FM Rigs  
                    Radio signalling under water?  
                    SWR calculation needed....

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>  
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available  
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

We trust that readers are intelligent enough to realize that all text  
herein consists of personal comments and does not represent the official  
policies or positions of any party. Your mileage may vary. So there.

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Date: 10 Aug 1994 17:02:39 -0500  
From: cs.utexas.edu!not-for-mail@uunet.uu.net  
Subject: AGC: Audio vs. IF derived  
To: ham-homebrew@ucsd.edu

I build radioes strictly as a hobby, and have a question for the  
wisdom of the net. Most discussions of Automatic Gain Control for  
receivers state something to the effect that IF-derived AGC is  
generally considered better, but that audio-derived is "simpler". My  
understanding is that most commercial shortwave receivers use  
IF-derived. However, my experience with homebuilt sets leads me to  
prefer audio-derived (at least for reception of am).

My argument for audio-derived AGC is that it provides much more

pleasing performance in the presence of carrier fades, especially in the case of a simple envelope detector. When the carrier fades in the IF-derived situation, receiver gain is cranked up to maintain the IF level, effectively increasing the volume of the overmodulated, distorted signal. This produces a very unpleasant "pumping" effect. I have noticed this in a number of commercial receivers. With audio derived AGC, however, the volume stays relatively constant resulting in a "smoothing" over the distortion. I suppose that sets with synchronous detection do not suffer as much, but I still notice this problem on my Sony 2010.

My question is, what is wrong with my argument? Obviously, there must be a compelling reason for IF-derived designs that I am missing. I am also interested in whether IF-derived AGC is necessary for synchronous detection (to stabilize the input to the phase detector) or whether audio-derived will work just as well (I want synchronous detection in my next homebrew set).

So what do y'all think. I say audio-derived wins hands down. What am I missing?

--John

--

*** John Zelle	e-mail: zelle@cs.utexas.edu	***
*** Taylor Hall 2.124	motto : I'd rather write programs which	***
*** University of Texas	write programs than waste my	***
*** Austin, TX 78712-1188	time writing programs	***

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Date: 10 Aug 1994 04:39:49 GMT  
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!gatech!news-feed-1.peachnet.edu!news.duke.edu!MathWorks.Com!yeshua.marcam.com!insosf1.infonet.net!usenet@network.ucsd.edu  
Subject: cell sites  
To: ham-homebrew@ucsd.edu

In article <329e3j\$ecu@hpindda.cup.hp.com>, bmp@cup.hp.com (Brian M. Perkin) writes:

>yctcsl@cerfnet.com wrote:

>

>: Does anyone have any info regarding the rate paid by PacBell (AirTouch) for  
>: establishing a cell site lease. The offers been made however I'd be interested to

>: find out just what being paid these days.

>

>

>I'd negotiate for a phone or two with free airtime as part of the deal.

>Brian

I know of a ham tt negotiated tt the outfit install and provide maint.  
for a ham band repeater, plus the electricity to operate it and they also  
would maintain the repeater!

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Date: 5 AUG 94 10:23:57  
From: pa.dec.com!mnews.mro.dec.com!est.enet.dec.com!randolph@decwrl.dec.com  
Subject: Ferrite cores and beads  
To: ham-homebrew@ucsd.edu

In article <YEE.94Aug4131058@mipgsun.mipg.upenn.edu>, yee@mipg.upenn.edu (Conway Yee) writes...

>I am working on a power/swr meter project and am in need of some  
>ferrite beads (Amidon FB73-101) and ferrite cores (Amidon T50-3). I  
>am unable to find a vendor for these. Newark, Active and Digikey  
>don't seem to carry it (at least by Amidon) and I don't know the part  
>numbers for other manufacturers.

Amidon Assoc., Inc.  
12033 Otsego St.  
N. Hollywood CA, 91607

Ask for a catalog.  
-Tom R. N100Q randolph@est.enet.dec.com

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Date: Wed, 10 Aug 1994 20:54:46 GMT  
From: walter!arctic!rcmcc@uunet.uu.net  
Subject: Freq standard from TV Colorburst subcar  
To: ham-homebrew@ucsd.edu

How stable are the handheld GPS receiver oscillators  
when locked on to the GPS satellites? They're  
getting down in price now that it's tempting.  
The Trimble Scout even does grid locators with two more  
characters than the traditional 6.

Ron McConnell, w2iol

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Date: Wed, 10 Aug 1994 14:34:35 GMT  
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!library.ucla.edu!europa.eng.gtefsd.com!  
gatech!wa4mei!ke4zv!gary@network.ucsd.edu

Subject: Freq standard from TV Colorburst subcarrier  
To: ham-homebrew@ucsd.edu

In article <327afl\$jj85@marconi.jpl.nasa.gov> cyamamot@marconi.jpl.nasa.gov  
(Clifford Yamamoto) writes:

>Greetings!

>

>Does anyone remember an old Radio Electronics or Popular Electronics  
>article that allowed one to use the colorburst subcarrier of any TV  
>station for use as a frequency reference. I remember reading that only  
>network stations (CBS, ABC & NBC) have their colorburst traceable to  
>NIST, but still it's a good stable source for a reference.

Not any more. Most, if not all, TV stations now receive their network  
feeds via satellite and use frame synchronizers to reclock the network  
signal to their local sync generator (usually only crystal controlled).  
So even when the station is relaying network programming, the color  
burst is only referenced to the crystal oscillator in the station. That  
only has to be within 10 Hz of nominal to be legal.

Satellite transmission also introduces it's own doppler errors that  
are +/- a few Hz, so even if you can use a TVRO to pick up the network  
signal directly, you still won't have a stable reference source. And,  
of course, the networks themselves have abandoned the atomic clocks  
they once used as references, so the original signal too is only  
referenced to a crystal oscillator, often not even in an oven.

In the old days, network feeds were over fixed telco paths, no  
doppler, and used atomic references in NY. Local stations used  
them as primary references and genlocked their own local sync  
generators to the incoming network signal. But that's long gone.  
Today, the networks switch their feeds from uplink source to  
uplink source during breaks, and that would cause local commercials  
to tear up from loss of reference, so no station genlocks to network  
anymore. Instead we use our frame synchronizers to effectively lock  
network to \*us\*.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

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Date: 9 Aug 1994 11:03:38 -0700

From: ihnp4.ucsd.edu!newshub.sdsu.edu!nic-nac.CSU.net!usc!howland.reston.ans.net!

gatech!udel!news.sprintlink.net!cyberspace.com!cyberspace.com!not-for-mail@network.ucsd.edu

Subject: Freq standard from TV Colorburst subcarrier

To: ham-homebrew@ucsd.edu

Clifford Yamamoto (cyamamot@marconi.jpl.nasa.gov) wrote:

: Greetings!

: Does anyone remember an old Radio Electronics or Popular Electronics  
: article that allowed one to use the colorburst subcarrier of any TV  
: station for use as a frequency reference. I remember reading that only  
: network stations (CBS, ABC & NBC) have their colorburst traceable to  
: NIST, but still it's a good stable source for a reference.

: I remember the board used some special chip that took 3.565 (whatever)  
: the colorburst freq is and put out 60Hz, 100Hz or some similar reference  
: frequency standard. I believe it had some sort of op-amp that inductively  
: coupled the colorburst signal out of a nearby TV to this special chip.

: Well any leads to parts or even a more recent article about using  
: TV signals for frequency standards would be appreciated.

: Thanks!

I built one of these back in 1978 (or thereabouts). I never saw the article but I think I know most of the details. First, the basics:

3.58MHz is actually derived from the ratio of two integers. I don't remember exactly what they are but, for now we will assume they are 14 and 39 (but I know these aren't correct). So  $3.58\text{MHz} = 10\text{MHz} \times 14 / 39$ . Using a phase-lock-loop, you can therefore derive 1MHz, 5MHz, and 10MHz from 3.58MHz. Similarly, you can derive 3.58MHz from 1, 5, or 10MHz.

The 3.58MHz signal in the TV is locked to the reference at the source of the TV Signal. Your TV uses a PLL for this. Every horiz blanking interval, the TV's local 3.58MHz oscillator is compared with a burst of 3.58MHz from the transmitter (the colorburst). This way, your TV's 3.58MHz reference is kept in sync with the 3.58MHz at the transmitter.

There is no guarantee that the 3.58MHz of the source (transmitter) is correct. It is usually close but definately not a great reference. When the TV programming comes from the Network (not the local station), the 3.58MHz is usually very close. (I think they use those expensive Ceisium (sp) Oscillators.) The evening news is a good network feed.

The FCC (or maybe the Federal Bureau of Standards) used to monitor the networks 3.58MHz color burst signal and publish the deviation on a monthly basis. This was discontinued in about 1980.

Now, the idea for creating a local lab standard was to build your own 1, 5, or 10MHz oscillator. Derive 3.58MHz from it using a PLL. Use a phase comparitor to compare your 3.58MHz to that of your TV during a network broadcast. Record the deviation as detected by the phase comparitor (usually measured in seconds/cycle of beat frequency). Compare your deviation to that published in the FCC's monthly report. Adjust the frequency of your reference oscillator and repeat the process.

In my design, I used a high quality Vectron 10MHz Oscillator-complete with an oven to maintain temperature and oscillator stability. I think the oscillator was rated a 1 part in 100,000,000,000 for short term and 1 part in 1,000,000,000 for long term stability. I think it cost around \$200.

I divided its output by 2 and 5 to create a 5MHz and a 1 MHz output respectively. I also divided the 10MHz by 39 to create 256KHz and a PLL to multiply this by 14 to get 3.58MHz. The PLL requires a 3.58MHz VCO which I built using a voltage controlled cap (diac?) and an ordinary 3.58MHz crystal from a TV.

I had an input from the TV's 3.58MHz oscillator and used a phase comparitor to compare this with my derived 3.58MHz. The output went to a analog meter (for making rough adjustments) and to a chart recorder when the phase difference was very small (measuring several seconds per beat).

In addition, I could use the phase comparitor to compare the 1, 5, or 10MHz output with an external signal. This allowed me to calibrate other equipment to my standard.

This project was complicated by the fact that all these frequencies operating in the same cabinet result in a lot of coupling. I had every oscillator (the 10MHz and the 3.58MHz) and both phase detectors (the one from the PLL and the one to compare the internal reference to an external source) in separate metal boxes. I think I even used separate power supplies for each circuit.

It worked well and, as far a I know, is still is use today.

Hope this helps and good luck.

Mark Champion

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Mark Champion

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Date: 10 Aug 1994 12:29:28 -0500

From: ihnp4.ucsd.edu!news.cerf.net!mvpb.saic.com!MathWorks.Com!

europa.eng.gtefsd.com!howland.reston.ans.net!cs.utexas.edu!gerald@cc.utexas.edu!  
huey.cc.utexas.edu!not-for-mail@network.ucsd.edu  
Subject: Freq standard from TV Colorburst subcarrier  
To: ham-homebrew@ucsd.edu

Has anyone else pointed out that the colorburst is only constant-phase in alternate sync intervals? They do this to make the striations of the color subcarrier less noticeable on B/W sets (those in decent focus, anyway ;-)) and it would noticeably affect your freq reference system anyway, even discounting the +/- 10 Hz spec mentioned in an earlier post, if not eliminated by some elaborate gating and inverting scheme ..

just my \$.02 ...

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<BGB>

lihan@ccwf.cc.utexas.edu / for flames, please consult  
(really Bruce Bostwick) / <http://acheron.hell.org/~devnull/>  
from the great state of TEXAS / #include <big.smiley.h>

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Date: 10 Aug 1994 16:14:42 GMT  
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!spool.mu.edu!umn.edu!  
newsdist.tc.umn.edu!dawn.mmm.com!tcdsp1!tahir@network.ucsd.edu  
Subject: IC-751A HF Transceiver  
To: ham-homebrew@ucsd.edu

Help! I picked up an IC-751A pretty (very) cheaply, hoping to repair it. Here's the problem it has a whole series of Japanese transistors (too many to list) 2SC..., 2SB..., 2SC and so forth. Any ideas as to where they might be obtained from.

Thanks.

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Date: 5 Aug 94 15:35:14 GMT  
From: ihnp4.ucsd.edu!munari.oz.au!sgiblab!bridge2!news.claremont.edu!  
paris.ics.uci.edu!csulb.edu!csus.edu!netcom.com!btoback@network.ucsd.edu  
Subject: New Life For Old FM Rigs  
To: ham-homebrew@ucsd.edu

In article <gregCu2GK4.JGv@netcom.com> greg@netcom.com (Greg Bullough) writes:  
>

>It's a shame to retire my Drake UV-3 to packet service, now that virtually  
>every local repeater requires PL tones.

>

>So I've been thinking about setting up an outboard sub-audible and DTMF  
>encoder. Now the encoder and the DTMF pad are easy to obtain. However,  
>most of the encoders seem to want a 5-bit encoding of values from 0-31  
>to select the sub-audible tones.

Communication Specialists has an encoder that can be programmed with  
a 31-position switch. You could also use a pair of hexadecimal thumbwheel  
switches with a little translation table, or an EPROM with a switch that  
contains just the PL frequencies you need. How much room do you have  
for the controls? Is there enough room for hex switches, a rotary switch,  
or whatever?

-- Bruce KN6MN

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Date: Mon, 8 Aug 1994 18:59:21 GMT  
From: nntp.ucsb.edu!library.ucla.edu!europa.eng.gtefsd.com!newsxfer.itd.umich.edu!  
zip.eecs.umich.edu!yeshua.marcam.com!charnel.ecst.csuchico.edu!csusac!csus.edu!  
netcom.com!@@ihnp4.ucsd.edu  
Subject: Radio signalling under water?  
To: ham-homebrew@ucsd.edu

I'm in need of advice and/or information on getting signals through  
to a submerged remote vehicle. We're currently running at about 50MHz,  
mostly due to the availability of six meter radio control gear. I know  
the Navy uses a buried VLF array to get to submarines at depth, and I  
wonder if I could use a \*very\* reduced scale version of what they're  
running -- perhaps a submerged loop? I've considered using ultrasonics,  
and any advice in that area would be invaluable as well

Oh, I should mention that I'm interested in distances on the order of  
fifty to a hundred feet, if possible.

Any and all input is welcomed. :) Thanks for your time!

Cheers,  
Alan Cooney  
acooney@netcom.com  
WD6DES

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Date: 10 Aug 1994 22:44:36 +0200  
From: ihnp4.ucsd.edu!muninari.oz.au!quagga.ru.ac.za!ee.und.ac.za!ticsa.com!  
cstatd.cstat.co.za!not-for-mail@network.ucsd.edu  
Subject: SWR calculation needed....



Actually, they are really personable. I've had a few people mail me, so here's more detail.

The units you want are the ones WITHOUT varactor tuning. If you order them in pairs, and ask them to tune them for the HAM band, you will be quite happy with the whole thing. They dd the tuning for me for free.

P/N MA86728

1 tuned to 10.345 GHz, 1 tuned to 10.450 GHz

M/A Com  
Microwave Associates International Inc.  
Burlington, MA  
01803 USA  
(617) 272-3000

I will be ordering piles more, they do T1 speed data real well.

: I would be glad to hear that they have become more reasonable. I've  
: been ignoring their ads because I didn't need the grief.

Perhaps they have learned a thing or two about customer realations, they are very willing to please, and quite helpful.

: Greg Young AC4YT  
: cheech@med.unc.edu  
Jeff@EE.Ryerson.Ca

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Date: 10 Aug 1994 17:02:20 GMT  
From: noc.near.net!sunfish.hi.com!brainiac.hi.com!user@uunet.uu.net  
To: ham-homebrew@ucsd.edu

References <7AUG199413272479@pavo.concordia.ca>, <776304324snz@arkas.demon.co.uk>,  
<8AUG199416550806@pavo.concordia.ca>t  
Subject : Re: NEC simulation software

The NEC Archive FTP site is located at ftp.netcom.com in /pub/rander/NEC

Steve Byan	internet: steve@hi.com
Hitachi Computer Products (America), Inc.	
1601 Trapelo Road	phone: (617) 890-0444
Waltham, MA 02154	FAX: (617) 890-4998

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End of Ham-Homebrew Digest V94 #231

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